



# 712 Form



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# Agile Target Effects Data Management Tool— ATE DMT

John Brand

US Army Research Laboratory  
APG, MD

John Domen

Nasir Jafrey

Ken Yagrish

US Army Armament Research, Development, and Engineering Center  
Picatinny Arsenal, NJ

Military Operations Research Society Symposium

US Army Military Academy  
West Point, NY  
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## Agile Target Effects Data Management Tool—ATE DMT

- Developed under Agile Target Effects Systems (ATES) Science and Technology Objective
- Originally a research tool with a narrow application in directed energy
- Relational database running on Microsoft SQL Server
- Links materiel to directed energy (DE) effects database
- Links materiel to fighting tips
- Allows best-guess inferences based on fundamental technology (“All else being equal....”)
- Links targets to “fighting tips”

→ Multi-use tool:

- > Materiel developer
- > Combat developer
- > Battle staff





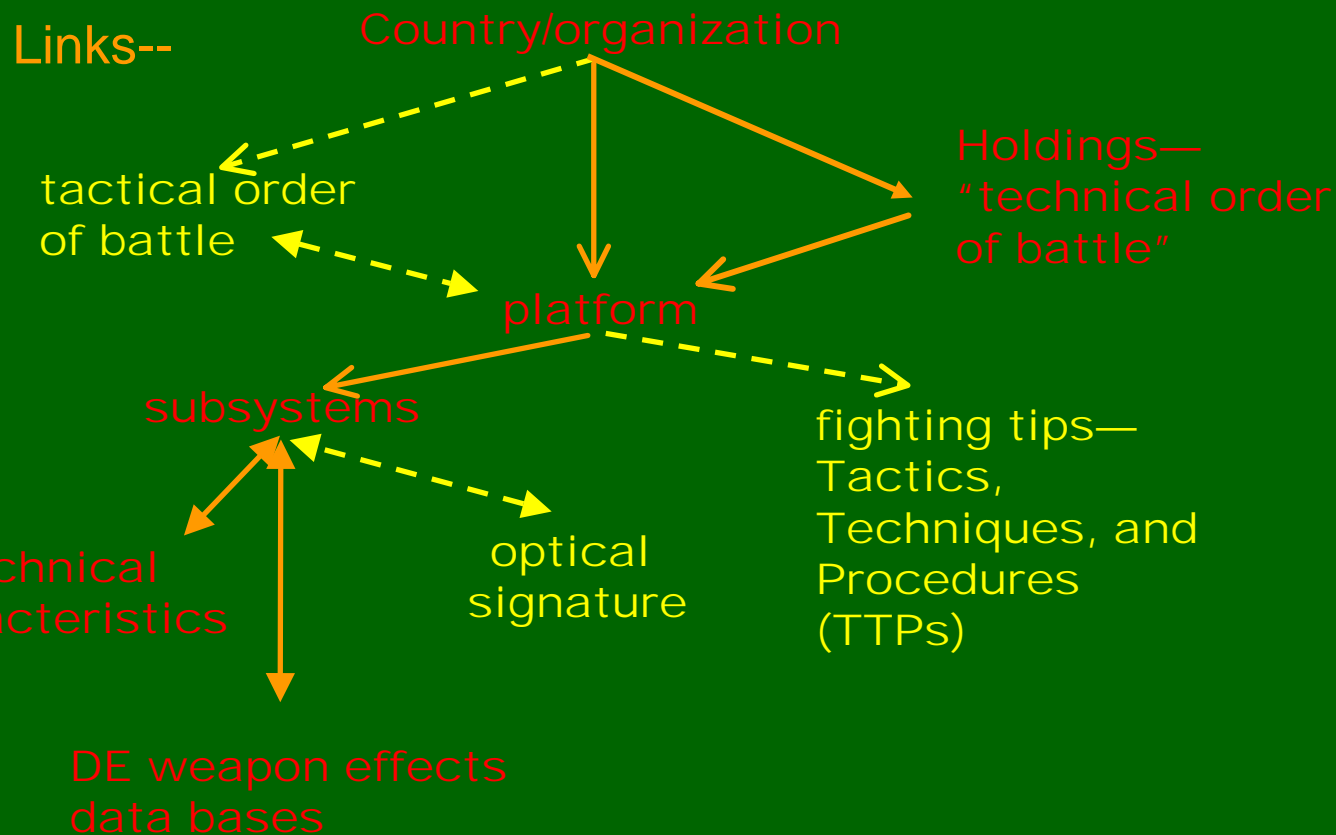
## Agile Target Effects Data Management Tool--continued

- Runs on laptop—planning on the fly
- Web based application or standalone
- Web paradigm allows
  - > central management
  - > central configuration control
  - > *fast* update in response to field emergencies
  - > remote access to current info
- Materiel and combat developers can interrogate effects database
- All users can access updated Tactics, Techniques, and Procedures (TTPs)
- Can be used by battle staff to plan and to respond to unexpected technical situations
- Aid to data fusion
- Not limited to DE effects and data
- Version 1 completed; version 2 will include enhancements such as “fighting tips”
- Fighting tips must be cooperative effort between battle staffs, R&D, combat developers





## Basic information links

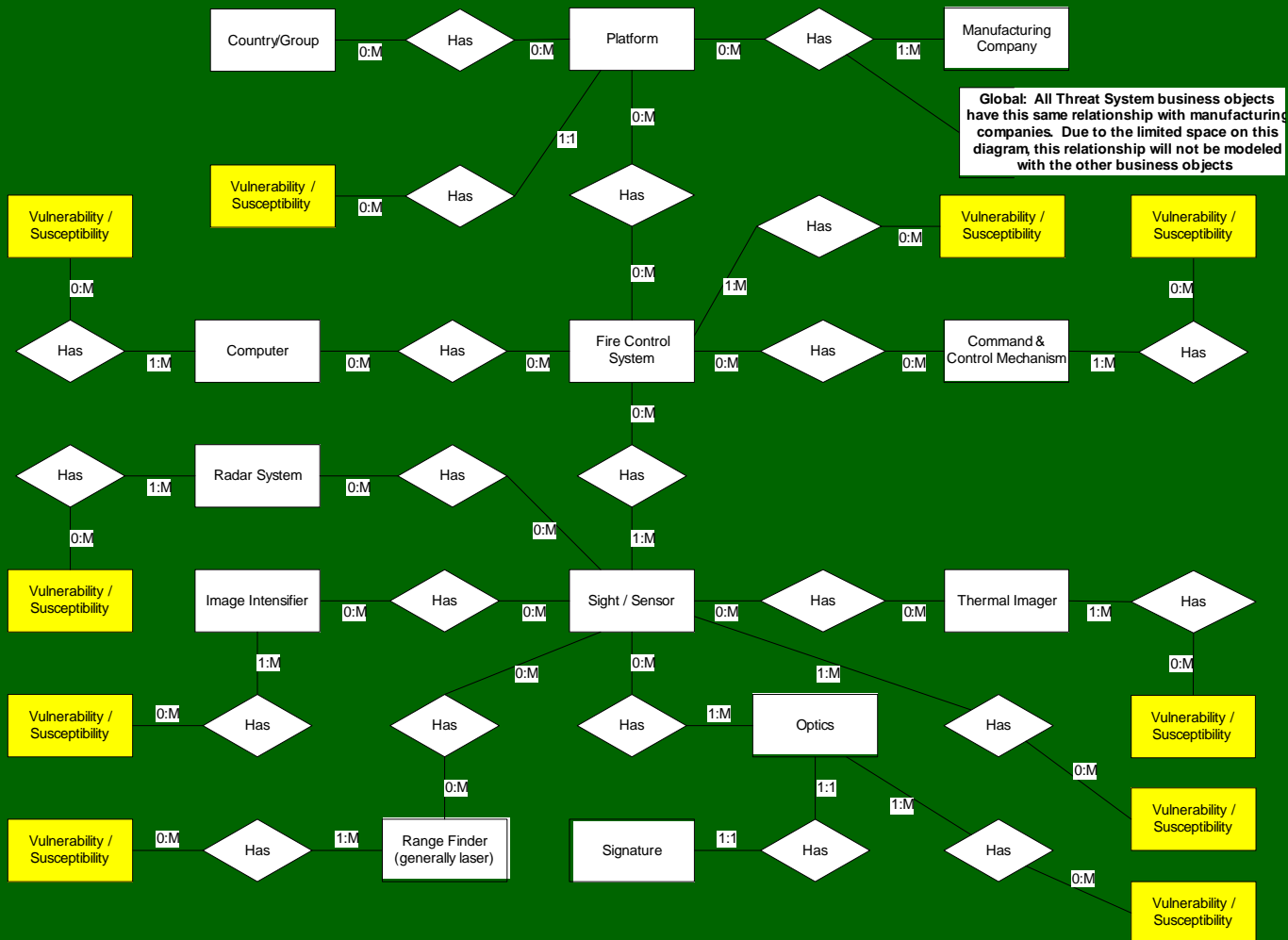


- ↔ Version 1--present
- ⋯ Version 2—planned or enhanced





## Simplified organization, version 1








# Basic point of entry to database



## Agile Target Effects



[References](#)[Threat Systems](#)[Advanced Energy Technologies](#)

[Countries/Groups](#)[Platforms](#)[Fire Control Systems](#)[Command & Control](#)[Weapons](#)[Computers](#)[Sights](#)[Thermal Imagers](#)[Optics](#)[Range Finders](#)[Radar Systems](#)[Image Intensifiers](#)[Manufacturing Companies](#)


[Add New Platform](#)

### Platforms




**1999 - USA M1A2 MBT Abrams**  
This is the latest Abrams tank which is an upgrade of the M1A1 version. The U.S. Army has ordered 1,150 M1A2SEP (S/tems Enhancement Package) to be in service by 2004

[View Vulnerabilities](#)



**1962 - USA M108 105mm Self-propelled gun**  
Sister vehicle, M109, has a 155mm gun on the same chassis replacing the Model 108. It has made the M108 obsolete. Both vehicles are highly mobile to avoid enemy counter fire. The M109 is still in widespread use and was very valuable in the Gulf war

[View Vulnerabilities](#)



**Infantry Fighting 1981-USA M2A2 Bradley Vehicle (IFV)**  
The improved M2A2 is equipped with heavier armor added to the hull sides and bottom increasing the weight, as well as many other changes including improved drive and suspension.

[View Vulnerabilities](#)



**1978 - USA M60A3 Main Battle Tank**  
Final production model of the M60 series. Has stabilization system for main armament, a more reliable power pack and a fire control computer and laser rangefinder for greater first-round hit probability. Israel continues to carry out improvements to the M60 series.

[View Vulnerabilities](#)


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## Can be used to assess impact of technologies

Advanced energy technology → platform or specific effects on that platform—not limited to DE




### Agile Target Effects



[References](#) [Threat Systems](#) [Advanced Energy Technologies](#)


### Advanced Energy Technologies



#### Radiation

Radiation is energy that comes from a source and travels through some material or through space. Light, heat and sound are types of radiation. The kind of radiation discussed in this presentation is called ionizing radiation because it can produce charged particles (ions) in matter.


[Create Effects](#) [Platforms](#) [View Effects](#)



#### Micron Laser

The objective of the proposed research is to develop a high-impact optical component for the telecommunications network. In particular there is a pressing need to identify and define an optical amplifier to serve in the network as a signal "repeater." The purpose of this device is to boost the signal light level in the fiber optic network back up to its original level after the system losses have diminished the intensity substantially, (usually after about 40 kilometers or so).


[Create Effects](#) [Platforms](#) [View Effects](#)



#### Directed Energy

A system using directed energy primarily for a purpose other than as a weapon. Directed-energy devices may produce effects that could allow the device to be used as a weapon against certain threats, for example, laser rangefinders and designators used against sensors that are sensitive to light.

[Create Effects](#) [Platforms](#) [View Effects](#)



#### Electro-Magnetic Pulse

The electromagnetic radiation from a nuclear explosion caused by Compton-recoil electrons and photoelectrons from photons scattered in the materials of the nuclear device or in a surrounding medium. The resulting electric and magnetic fields may couple with electrical/electronic systems to produce damaging current and voltage surges. May also be caused by nonnuclear means.

[Create Effects](#) [Platforms](#) [View Effects](#)

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Can be used to investigate platform configurations

platform → detailed technical info on that platform (*not limited to fire control, electronics, etc.*)

The screenshot shows a web application titled "Platforms Configuration". On the left is a navigation menu with categories: "Countries / Groups", "Platforms", "Fire Control Systems", "Command Control", "Weapons", "Computers", "Sights", "Thermal Sights", "Optics", "Range Finders", "Radar Systems", "Image Intensifiers", and "Manufacturing Companies". The "Platforms" category is selected. Below the menu is a small image of an AMX-10P vehicle, an "Upload Image" button, and a "Supporting Documents" button. The main content area has tabs for "References", "Threat Systems", and "Advanced Energy Technologies". The "References" tab is active. It contains a "Name:" field with "AMX-10P", a "Description:" field with "AMX-10P Infantry Light Armored Vehicle", a "Classification:" section with "Unclassified" selected, a "Reference:" field, a "Manufacturing Company:" section with a list of companies (Alenia, Allied Signal, Alvis Vehicles, Amcoram, Amcor, Arsenalul Armetei, Aselsan (Raytheon)) and a search box, and a "Country / Group:" section with "Albania" and "France" selected. The bottom status bar shows "Done" and "Local intranet".





Can be used to investigate technical aspects of opposition—  
planning on the fly

Country → platform → detailed technical info on that platform (*not limited to fire control, electronics, etc.*), and how to exploit or counter them

tblPlatform data management

User's platform data management tool

platform name M1A1

select platform M1A1

sel. basic vehicle M1

manufacturing company General Dynamics Land

modifying company unknown

using service 1 Army

using service 2 Marine

laser source unknown

laser warning receiver

radio 1 unknown

radio 2 unknown

ballistic computer

tactical/SA/BM oc

Record: 1 of 4 (Filtered)

laser based CM unknown

non-laser CM smoke grenade

select classification UNCLASSIFIED

classified by NA

declassify on NA

references

countermeasure system is smoke grenade system L8A1, M250  
(http://www.fprado.com/armorsite/abrams.htm) Also has engine generated smoke.

platform level effects

fighting tips

FCS

inventory by country

sights

tblAssocFightingTips\_Platform subform1

select fighting tips countering anti-thermal night sight

Ordinary oil based, white phosphorus, or combustion based smoke such as smoke resulting from grass fires does not greatly affect the wavelengths used by either thermal night sights or beams used to jam thermal night sights. Enough will, but the smoke density required from those sources is quite high. Dust from high explosive shell will attenuate those wavelengths somewhat, enough dust will attenuate the beam or obscure the scene quite a lot.

tblAssocPlatform\_Sight user version subform

sight/subsystem name M939 Gunner's Auxiliary Sight

select sight/subsystem M939 Gunner's Auxiliary Sight

refresh

sight level effects

sight level signatures

add/change sights

add/change effects

sight ID	sight name	detector	spectrum	las hard?	lo-sig reticle?
1	unknown	unknown	unknown	No	No
201	generic coaxial telescope	unknown	unknown	No	No
210	M939 Gunner's Auxiliary Sight	unknown	unknown	No	No
3	GPS	unknown	unknown	No	No

sight ID	dev. company	dev. country	detector	I2 tech.	TNS tech.
204	unknown	unknown	unknown	unknown	unknown
207	Pilkington	UK	HgCT	unknown	unspecified MC
210	Kollmorgen	USA	unknown	unknown	none
211	Raytheon	USA	NA	unknown	none

(to be added in version 2; Access forms shown here to illustrate functionality)





Can be used to investigate technical aspects of opposition—  
planning on the fly

Platform → fighting tips, triggered by situation encountered

tblPlatformFightingTipsSelection

platform (modified vehicle) name: M1A1 Platform ID: 114

select platform: M1A1 Refresh

tblAssocFightingTips\_Platform subform1

fighting tips selection: countering anti-thermal night sight lasers--glare Refresh

platform vs fighting tips

	FightingTipsID	Platform ID
114 M1A1 4	defeat of laser homing missiles	
116 M1A1D 4	defeat of laser homing missiles	
117 M1A2 SEP 4	defeat of laser homing missiles	
113 M1 6	countering anti-thermal night sight lasers--glare	
114 M1A1 6	countering anti-thermal night sight lasers--glare	
115 M1A2 6	countering anti-thermal night sight lasers--glare	
117 M1A2 SEP 6	countering anti-thermal night sight lasers--glare	

tblFightingTips subform

title/subject: countering anti-thermal night sight lasers--glare Refresh

classification: UNCLASSIFIED declassify on: NA

tips: FightingTipsID: 6 classified by: NA

Some lasers--notably CO2--are in-band to most thermal night sights. They may lase at many wavelengths within this band, most commonly 10.6 micrometers. A thermal night sight whose aperture is flooded with light in this band may be damaged or washed out. Damage can be: catastrophic--the night sight ceases to work--; minor--the sight has elements destroyed, producing dark or white lines in the display, depending on whether the sight is set to white-hot or black-hot, or the sight can be jammed--the scene is washed out or obliterated. If a laser does cause the night sight to turn the "laser filter" back to a setting that removes

source:

references:

Record: 1 of 1

Record: 3 of 6

Record: 49 of 105

(to be added in version 2; Access forms shown here to illustrate functionality)





## Can be used to investigate technical aspects of opposition— planning on the fly



### Platform → fighting tips

Example scenario—

Expeditionary force Task Force Smythe air landed in distant island to bolster indigenous forces against expected air and sea assault

Helicopter gunner reports dazzling green flash just before pilot loses control and crashes

Light armored vehicle commanders report enemy vehicles appear to be Chinese type 98 tanks

Infantry units report dazzling lines of light targeted on missile crews, but missile crews using thermal sights engage successfully

S-2 interrogates ATE DMT terminal on type 98—data base responds that some type 98s were reported on the internet with a directed energy search/blinder countermeasure set  
(<http://www.sinodefence.com/army/tank/type98.asp>, accessed 17 May 2005)

Fighting tip—TTP—corresponding advises engagement with thermal sights, luring enemy engagement with dummy I2 sights to make enemy disclose position, then engage with thermal night sights and conventional rounds or Javelin

S-2 passes info to units

Units report success in destroying enemy tank unit





# Summary



## The ATE DMT

- Has the potential for drastically reducing the time for an analyst to devise an evaluation plan
- Can substantially aid an analyst or designer in picking through the technological options available
- Has the potential to aid an expeditionary battle staff in countering unexpected technologically sophisticated enemy systems
- Can help battle staff and commanders use their systems to gain the most advantage





# Backups







## Simplified interface

tblPlatform data management

User's platform data management tool

Refresh Close Form 114

platform name M1A1

select platform M1A1

sel. basic vehicle M1

manufacturing company General Dynamics Land

modifying company unknown

using service 1 Army

using service 2 Marine

laser source unknown

laser warning receiver

radio 1 unknown

radio 2 unknown

ballistic computer

tactical/SA/BM cc

Record: 114

laser based CM unknown

non-laser CM smoke grenade

select classification UNCLASSIFIED

classified by: NA

declassify on NA

references

countermeasure system is smoke grenade system L8A1, M250 (http://www.fprado.com/armorsite/abrams.htm) Also has engine generated smoke.

platform level effects

fighting tips

FCS

inventory by country

sights

tblAssocFightingTips\_Platform subform1

select fighting tips countering anti-thermal night sight

Refresh

Ordinary oil based, white phosphorus, or combustion based smoke such as smoke resulting from grass fires does not greatly affect the wavelengths used by either thermal night sights or beams used to jam thermal night sights. Enough will, but the smoke density required from those sources is quite high. Dust from high explosive shell will attenuate those wavelengths somewhat: enough dust will attenuate the beam or obscure the scene quite a lot.

tblAssocPlatform\_Sight user version subform

sight/subsystem name M939 Gunner's Auxilian

select sight/subsystem M939 Gunner's Auxiliary Sight

refresh

210

sight ID sight name detector spectrum las hard? lo-sig reticle?

1	unknown	unknown	unknown	No	No
201	generic coaxial telescope	unknown	unknown	No	No
210	M939 Gunner's Auxiliary Sight	unknown	unknown	No	No
3	GPS	unknown	unknown	No	No

sight ID dev. company dev. country detector I2 tech. TNS tech

204	unknown	unknown	unknown	unknown	unknown
207	Pilkington	UK	HgCT	unknown	unspecified MC
210	Kollmorgen	USA	NA	unknown	none
211	Raytheon	USA	NA	unknown	none

Record: 1 of 4 (Filtered)

sight level effects

sight level signatures

add/change sights

add/change effects





# Materiel developer tool—sighting subsystems

**Sight/subsystem management tool** refresh data Close

Name:  select sight/subsystem:

select sight type:  Accuracy:  II WFOV 1:  TNS WFOV:  tbAssocSight\_Signature subform

classification:  Data Output format:  II NFOV 2:  TNS NFOV:  notional optical signature 2-NIR:  select associated signature:

classified by:  Spectrum:  II magnification 1:  TNS magnification 1:  signature name:  link to data:

declass. on:  Gain:  II magnification 2:  TNS magnification 2:  select signature:  freq. range:  opt./ther. cont.:

Users:  TNS ID:  TNS transmission 1:  classification:  spectrum:  declass.:  opt. Xsect./lambda:

tbAssocSight\_Developing Company subform

devel. company:  change  select company:  Refresh  TNS transmission 2:  TNS aperture 1:  TNS aperture 2:  TNS filters, bands, 0:

Record:  of 1

tbAssocSight\_Developing Country subform

devel. country:  change  select country:  refresh  TNS filters, bands, 1:  band 1 (visible) ☒ band 2 NIR ☒ band 3 (MWIR) ☐ band 4 (Thermal IR) ☐

Record:  of 1

Application:

Description:

reduced signature reticle: ☐

IIT ID:

TechIID:

Identification range (m):

Recognition range (m):

Detection range (m):

Notes:  ☐

References:

array:

tbAssocSights\_Effects subform1

effect name:  classification:  select effect:  classified by:  relevance:  comments:  declassify on:

Record:  of 1

tbAssocSights\_OpticalThreat

Threat name:  classification:  select threat:  classified by:  links to data:  declassify on:

Record:  of 2

tbAssocSights\_Artillery Guided Munitions subform

GAM name:  Refresh  select guided art. mun.:  add/change GAM

Record:  of 1

tbAssocSights\_ATM subform

ATM:  add/change ATM  select ATM:  Refresh

Record:  of 1

Record:  of 157





## Signature search tool

**Signature search tool**

signature name:  spectrum:

select signature:  description:

frequency range:

optical cross section/wa:  comments:

radar cross section/freq:  references:

optical/thermal contrast:  link to data:

classification:  refresh:

classified by:

declassify on:

list of possible platforms

signature ID	spectrum ID	signature name	sight name	platform name	holdings est. 1	holdings est. 2	nation
10	8	notional optical signature 2-NIR	AN/VVS-2	M1	218		Kuwait
10	8	notional optical signature 2-NIR	M939 Gunner's Au	M1A1	4393		USA
10	8	notional optical signature 2-NIR	M938 Commander's	M1A1	4393		USA
10	8	notional optical signature 2-NIR	AN/VVS-2	M1A1	4393		USA
10	8	notional optical signature 2-NIR	AN/VVS-2	M1A2	586		USA
10	8	notional optical signature 2-NIR	M938 Commander's	M1A2	586		USA
10	8	notional optical signature 2-NIR	M939 Gunner's Au	M1A2	586		USA
10	8	notional optical signature 2-NIR	GPS-2nd Gen	M1A2	586		USA
10	8	notional optical signature 2-NIR	M939 Gunner's Au	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	GPS-2nd Gen	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	AN/VVS-2	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	M938 Commander's	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	1 meter coincidenc	M-47	8	0	Bosnia-Herzegovina
10	8	notional optical signature 2-NIR	1 meter coincidenc	M-47	78		Jordan

Record:      of 12